

# Homework: Advanced SQL

1. Return names of every employee who works in the "Hardware", "Software", and "Research" departments.

```
SELECT emp.ename FROM emp
JOIN works w1 ON emp.eid = w1.eid
      JOIN dept d1 ON w1.did = d1.did AND d1.dname = 'Hardware'
JOIN works w2 ON emp.eid = w2.eid
      JOIN dept d2 ON w2.did = d2.did AND d2.dname = 'Software'
JOIN works w3 ON emp.eid = w3.eid
      JOIN dept d3 ON w3.did = d3.did AND d3.dname = 'Research'
```

2. Return the names of every department without any employee.

```
SELECT dept.dname FROM dept
LEFT JOIN works ON dept.did = works.did
WHERE works.eid IS NULL
```

3. Print the managerid of managers who manage only departments with budgets greater than \$1.5 million. (NOTE: The answer provided on canvas is incorrect, there are two budgets above \$ 1.5 million) [8, Hardware, 4291505, 111692]

```
SELECT managerid FROM dept
WHERE budget > 1500000
```

4. Print the name of employees whose salary is less than or equal to the salary of every employee.

```
SELECT ename FROM emp
WHERE salary = (SELECT MIN(salary) FROM emp)
```

5. Print the enames of managers who manage the departments with the largest budget.

```
SELECT emp.ename FROM emp
JOIN dept ON emp.eid = dept.managerid
WHERE budget = (SELECT MAX(budget) FROM dept)
```

6. Print the name of every department and the average salary of the employees of that department. The department must have a budget more than or equal to \$50.

```
SELECT dept.dname, AVG(emp.salary) AS avg_salary FROM dept
JOIN works ON dept.did = works.did
      JOIN emp ON works.eid = emp.eid WHERE dept.budget >= 50
GROUP BY dept.dname
```

7. Print the managerids of managers who control the largest amount of total budget. As an example, if a manager manages two departments, the amount of total budget for him/her will be the sum of the budgets of the two departments. We want to find managers that have max total budget.

```
WITH manager_budgets AS
(
    SELECT managerid, SUM(budget) AS total_budget FROM dept
    GROUP BY managerid
)

SELECT managerid
FROM manager_budgets
WHERE total_budget = (SELECT MAX(total_budget) FROM manager_budgets);
```

8. Print the name of every employee who works only in the "Hardware" department.

```
SELECT emp.ename FROM emp
JOIN works ON emp.eid = works.eid
JOIN dept ON works.did = dept.did
GROUP BY emp.ename
HAVING COUNT(DISTINCT dept.dname) = 1 AND MAX(dept.dname) = 'Hardware';
```